

ABSTRACT OF THE INVENTION

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Isolated nucleic acid compositions and sequences of anergy associated genes are provided, including the novel GRAIL gene. Expression of these genes is upregulated during the early stages of induction of anergy. The murine GRAIL sequence is shown to attenuate IL-2 transcription in T cells during response to antigenic stimulation. The identification of genes involved in the induction of anergy is useful in the evaluation of the pathophysiology or immunotherapy of cancer, autoimmune disease, and transplant rejection. Genetic sequences involved in anergy induction are useful markers in the evaluation of specific immunotherapies. Functional characterization of genes involved in anergy induction allows the elucidation of the mechanism(s) of T cell anergy, including the transcriptional blockade of IL-2, which may be manipulated to regulate T cell responses in human disease. The signaling pathways involving GRAIL are of significant interest in the identification of drugs that either block or upregulate the function(s) of GRAIL.